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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,188	06/16/2005	Nobuhiro Ito	14633.0008USWO	2230

52835 7590 05/12/2009  
HAMRE, SCHUMANN, MUELLER & LARSON, P.C.  
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MINNEAPOLIS, MN 55402-0902

EXAMINER
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NWAONICHA, CHUKWUMA O

ART UNIT	PAPER NUMBER
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1621

MAIL DATE	DELIVERY MODE
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05/12/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,188	<b>Applicant(s)</b> ITO ET AL.	
	<b>Examiner</b> CHUKWUMA O. NWAONICHA	<b>Art Unit</b> 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11 and 12 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-10 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### **Continued Examination**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under Ex Parte Quayle, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 10 April 2009 has been entered.

### **Current Status**

1. This action is responsive to Applicants' amendment of 10 April 2009.
2. Receipt and entry of Applicants' amendment is acknowledged.
3. Claims 1-3 and 5-13 are pending in the application.

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 5-10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dingwen et al., {JP 4517402} in view of Kato et al., {US 4,874,890}.

Applicants claim a method for deuteration of a compound represented by the general formula 1; wherein all the variables are as defined in the claims.

**Determination of the scope and content of the prior art (M.P.E.P. §2141.01)**

Dingwen et al. teach a general method that enables the replacement of light hydrogen with a heavy hydrogen isotope in numerous organic compounds including high molecular weight compounds. This new method can be used to manufacture heavy hydrogen containing compounds on a small scale experimentally and, moreover, it can be used for manufacturing on an industrial scale.

Dingwen et al. teach that the immediate substitution of light hydrogen with deuterium is possible using appropriate sources of heavy hydrogen (deuterium). In the initial attempts at substituting light hydrogen with deuterium, organic compounds were treated with heavy water in the presence of an alkali and platinum catalyst. This method achieved the replacement of mobile hydrogen atoms. The method is characterized in that, in the course of a direct substitution reaction that occurs between

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an organic compound that contains light hydrogen and a source of heavy hydrogen, such as deuterium oxide, in the presence of an alkaline metal deuteroxide and a reduced Adams catalyst ( $\text{PtO}_2 \cdot \text{H}_2\text{O}$ ), deuterium peroxide is added as the reaction promoter.

The method can be used to manufacture, for example, a completely deuterated aliphatic acid, dicarboxylic acid, ketone, alcohol, and a variety of hydrocarbons; therefore, it has broad applicability. This method can be used to produce deuterium-containing compounds with a high degree of isotope purity (99% or more), and this degree of isotope purity is limited only by the degree of isotope purity of the deuterium source.

**Ascertainment of the difference between the prior art and the claims (M.P.E.P., §2141.02)**

Dingwen et al. method for deuteration of a compound differs from the instantly claimed process in that applicants' claim a process that employs a hydrogen gas or heavy hydrogen gas while Dingwen et al. are silent about the use of a hydrogen gas or heavy hydrogen gas.

However, Kato et al. teach a process that employed a heavy hydrogen gas. See page 476.

**Finding of prima facie obviousness--rational and motivation (M.P.E.P., §2142-2143)**

The instantly claimed method for deuteration of a compound would have been suggested to one of ordinary skill because one of ordinary skill wishing to obtain a

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deuterated compound is taught to employ the processes of Dingwen et al. and Kato et al.

One of ordinary skill in the art would have a reasonable expectation of success in practicing the instant invention by varying the process conditions from the teaching of Dingwen et al. and Kato et al. to arrive at the instantly claimed method for deuteration of a compound. Said person would have been motivated to practice the teaching of the references cited because they demonstrate that deuterated compound are useful in industrial applications.

The Examiner notes that varying the reaction conditions in a chemical reaction is a well-known chemical practice to optimize the process efficiency of the system and does not constitute a patentable distinction. Merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 105 U. S. P. Q. 233 (C. C. P. A. 1955). Additionally, there is nothing on the record that clearly teaches that the processes of Dingwen et al. and Kato et al. do not activate in advance the catalyst before use as claimed by Applicants.

Moreover, all the claimed elements were known in the prior art references cited and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

### ***Allowed Claims***

Claims 11 and 12 are allowable over the prior art of record.

***Reason For Allowance***

The following is an examiner's statement of reasons for allowance: A search of the prior art failed to uncover any reference that anticipates or renders obvious a method for deuteration of a compound represented by the general formula 1; wherein all the variables are as defined in the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chukwuma O. Nwaonicha whose telephone number is 571-272-2908. The examiner can normally be reached on Monday thru Friday, 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chukwuma O. Nwaonicha/  
Examiner, Art Unit 1621

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/Jafar Parsa/

Primary Examiner, Art Unit 1621